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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,138	03/11/2004	Andy Yu	20359.2	5554
49358	7590	04/05/2006	EXAMINER	
CARLTON FIELDS, PA 1201 WEST PEACHTREE STREET 3000 ONE ATLANTIC CENTER ATLANTA, GA 30309			VU, DAVID	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/798,138

Applicant(s)

YU ET AL.

Examiner

DAVID VU

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>06/20/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/ Restriction

1. Applicant's election of Species I (Claims 1-40) filed on 01/09/06 is acknowledged. The traverse is on the ground(s) that "the memory cells and memory arrays are not independent of each other". The examiner withdraws the species requirement, thus all of the device claims 1-40 are examined as follows.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-6, 8-26 and 28-40 are rejected under 35 U. S. C. 102(e) as being anticipated by Hung et al. (US 6,765,260, herein after Hung).

Regarding claims 1-4, 6, 21-24 and 26, Hung discloses in figs. 3G-3H an electrically erasable programmable memory device, comprising: a first semiconductor layer 200 doped with a first dopant in a first concentration (p-type); a second semiconductor layer 202, adjacent the

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first semiconductor layer 200, doped with a second dopant that has an opposite electrical characteristic than the first dopant (n-type), the second semiconductor layer having a top side; two spaced-apart diffusion regions 212/216 embedded in the top side of the second semiconductor layer, each diffusion region doped with the first dopant in a second concentration greater than the first concentration (col. 6, lines 4-25), the two diffusion regions including a, first diffusion region 218a/218b and a second diffusion region 216, a first channel region defined between the first diffusion region 218a/218b and the second diffusion region 216; a floating gate 214a/214b, comprising a conductive material, disposed adjacent the first diffusion region 218a/218b and above the first channel region and separated therefrom by a first insulator region 212, the floating gate 214a/214b capable of storing electrical charge and having at least two lateral sides; and a control gate 208a/208b, comprising a conductive material, disposed laterally adjacent the floating gate 214a/214b and surrounding at least two sides of the floating gate (see fig. 6) and separated therefrom by a vertical insulator layer 212, the control gate 208a/208b being disposed above the first channel region and separated therefrom by a second insulator region 206a/206b.

Regarding claims 5 and 25, Hung discloses the first insulator region 212 having a thickness of about 90 angstroms (col. 5, lines 35-39).

Regarding claims 8 and 28, Hung discloses the floating gate 214a/214b and the control gate 208a/208b are wrapped by a spacer 212/210/220 (fig. 3H).

Regarding claims 9, 15, 29 and 35, Hung discloses the second diffusion 216 is in contact with a vertical connector 230, the vertical connector 230 being separated from the control gate 208a/208b by a second vertical insulator 212 (fig. 3H).

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As for the recitation that “wherein charge is transported from the first channel region to the floating gate when a first combination of voltages is applied.....” (claims 10-14, 16-20, 30-34 and 36-40), it refers to an operational limitation and any such limitation must distinguish from the prior art in terms of structure rather than function, *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); See also *In re Swinehart*, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971; *In re Danly*, 263, F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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3. Claims 7 and 27 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Hung (US 6,765,260) in view of Hong (US Pat. 5,427,968).

Hung fails to disclose the first vertical insulator is an ONO structure. However, Hong teaches in col. 3, lines 63-68 that the vertical insulator layer 64 is formed of ONO (figs. 4c-4d). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Hung by forming the ONO layer as taught by Hong since the material such as oxide, NO or ONO layer is recognized equivalent material for forming the dielectric layer in a semiconductor device.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (571) 272-1798. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm. If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



DAVID VU
PRIMARY EXAMINER